Newark Bay Study Area
Process for Finalizing Selection of Ecological Contaminants of Concern

20 October 2020

Internal EPA/USACE Team Presentation

with input from our team subcontractors:

warren pinnacle consulting, inc.

BATTELLE

It can be done

Ecological Contaminant of Concern (COC) Status

1. Preliminary COCs (include any LOAEL HQs > 1); **all required to be carried forward to the FS**
2. GSH recommended eleven "Final COCs" for Preliminary Remediation Goal (PRG) development
3. EPA suggested that nickel may also be a risk driver for clams
4. Ecological COC list to be finalized following upcoming call with GSH on 27 October 2020
5. Correlated analytes may not require PRGs (which provides options for EPA decision making)

Redacted

Other Noticed Parties Potentially Associated with Newark Bay Contamination [1]

1. Amcol Realty Co/Colt Corporation
2. BSAF Catalysts LLC
3. Bayer Corporation
4. Beaser East, Inc.
5. Chevron Texaco
6. Cycle Chem, Inc.
7. Cytec Industries, Inc.
8. E.I. duPont de Nemours
9. Exxon Mobil Corporation
10. General Cable Industries
11. Honeywell International
12. IBM Corporation
13. ICI Americas Inc.
14. ISP Environmental
15. Koppers, Inc.
16. OENJ Cherokee Corporation
15. Prentiss Drug & Chemical
16. Public Service Electric & Gas
17. Reichhold, Inc.
18. Troy Chemical Corporation

[1] From "Potentially Responsible Parties Named by EPA as of August 2012" list.

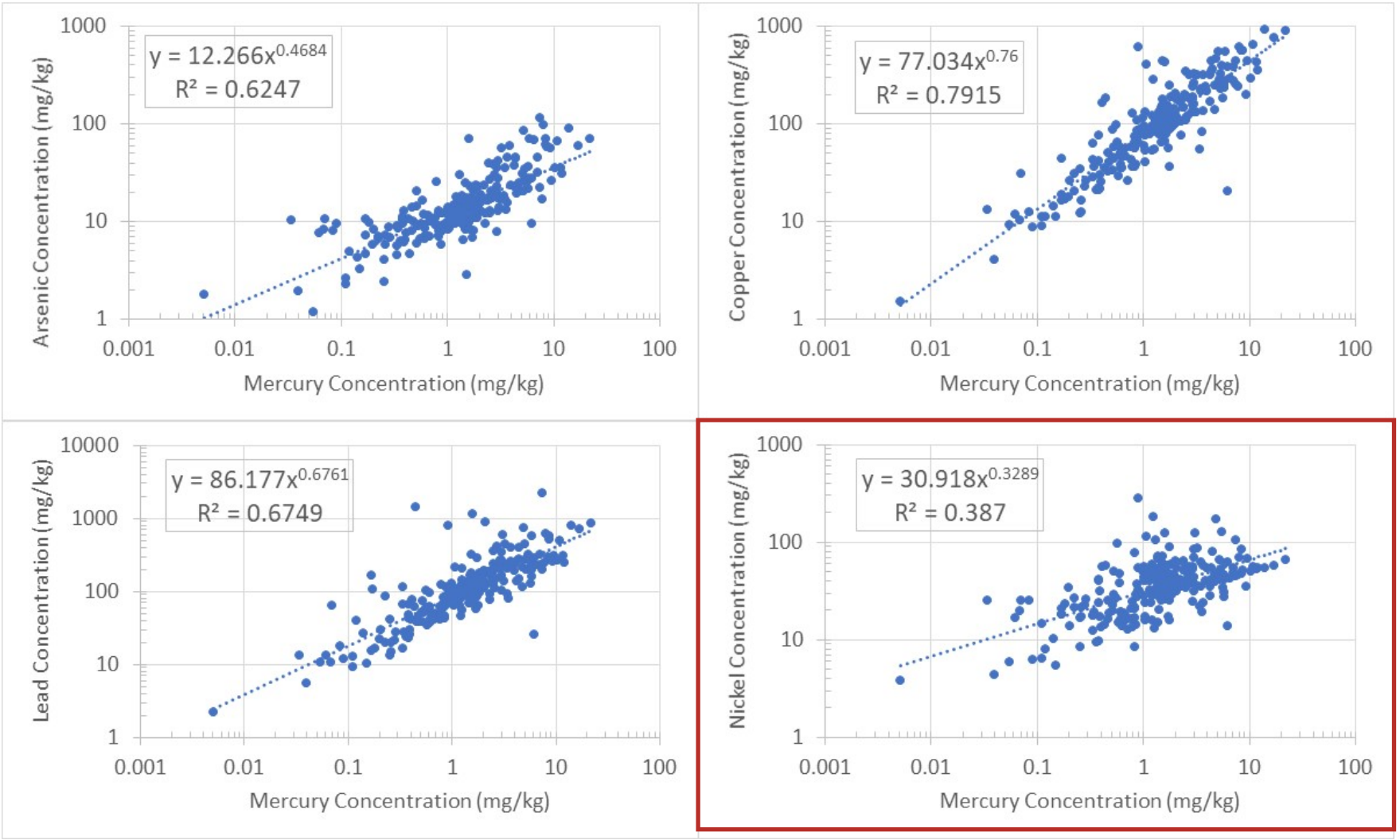
Getting from Preliminary COCs to Risk Drivers and Establishing PRGs

1. BERA identified preliminary COCs and recommended risk drivers using a Weight-of-Evidence (WOE) approach
2. Current Status of COCs
   a. *GSH suggests that 3 metals (arsenic, copper and lead) identified as risk drivers might not require PRGs*
   b. *Copper human health toxicity criterion under review; ecological risks for copper elevated, but GSH claiming that risks are too uncertain*
   c. *EPA reviewed the WOE approach and recommends nickel (clam tissue) also be included as a potential risk driver*
   d. *Evaluating correlation of surficial sediment COCs with Lister Avenue COCs*
   e. *[Redacted]*
3. valuate relative uncertainties/select toxicity thresholds (*not for discussion today*)
4. *Consider background concentrations*

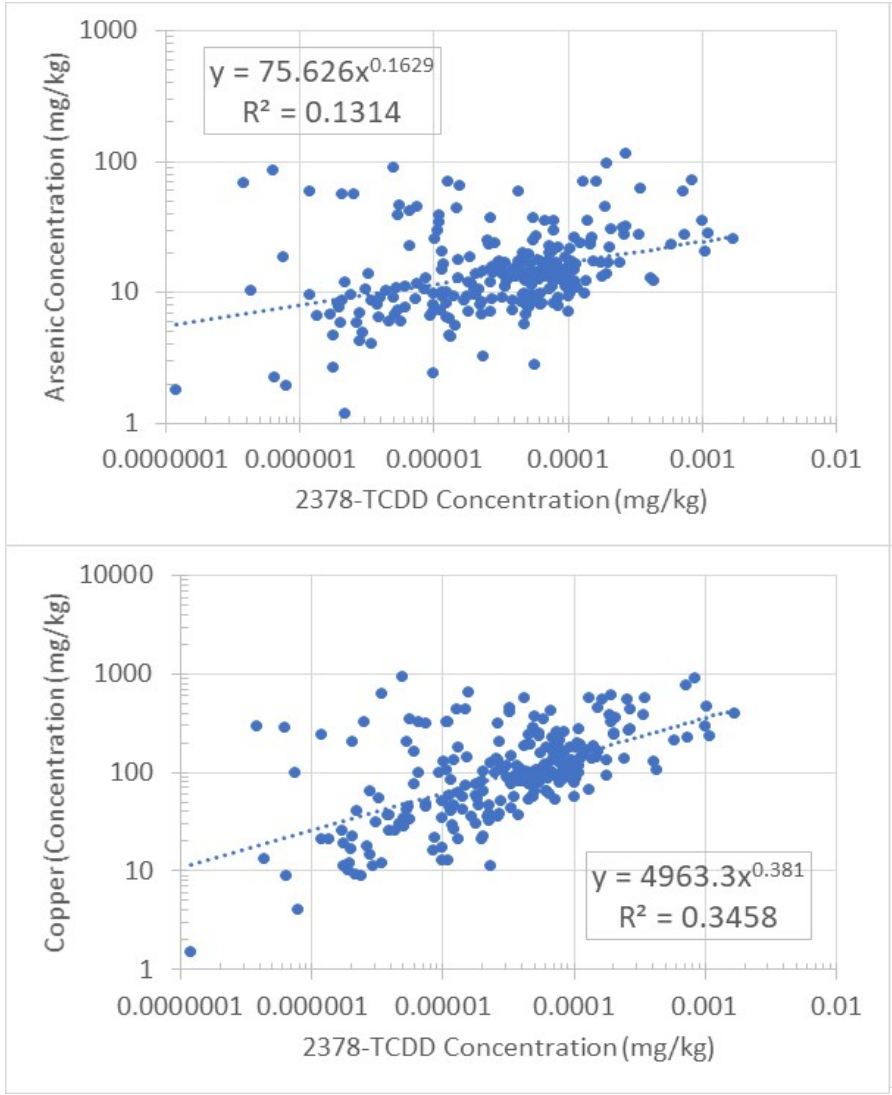
Data Summaries Available for Additional Discussion

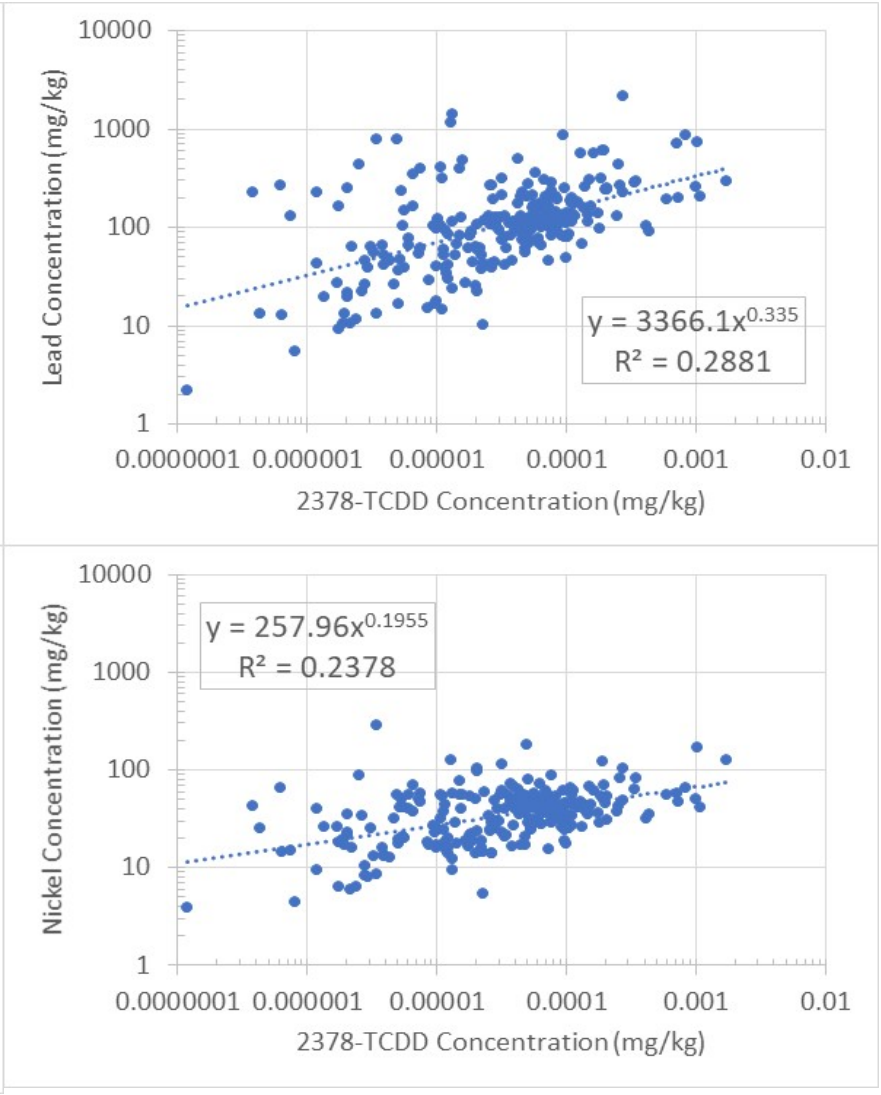
1. COC correlations with Mercury and 2,3,7,8-TCDD (*2 slides available for discussion*)
2. Spatial Distribution of COCs in Surficial Sediments (*3 slides available for discussion*)
3. Modeled toxicity (*1 slide available for discussion*)
4. Comparison of Newark Bay sediment chemistry with sediments above Dundee Dam, Passaic River, and Jamaica Bay reference area (*1 slide available for discussion*)

Correlations with Mercury in Surficial Sediment



Correlations with 2,3,7,8 -TCDD in Surficial Sediment

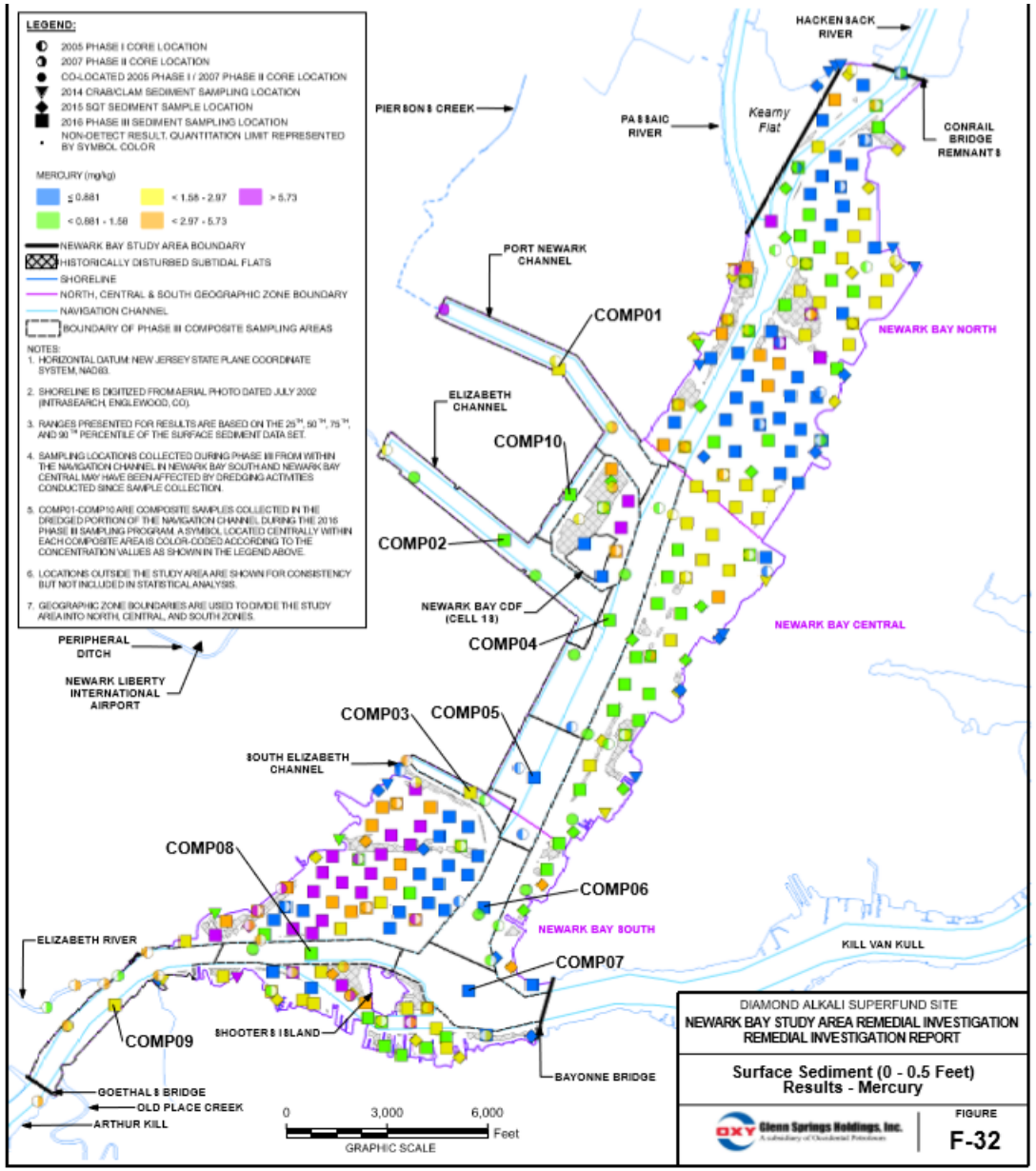




Reference: GSH, 2020, Draft RI Report

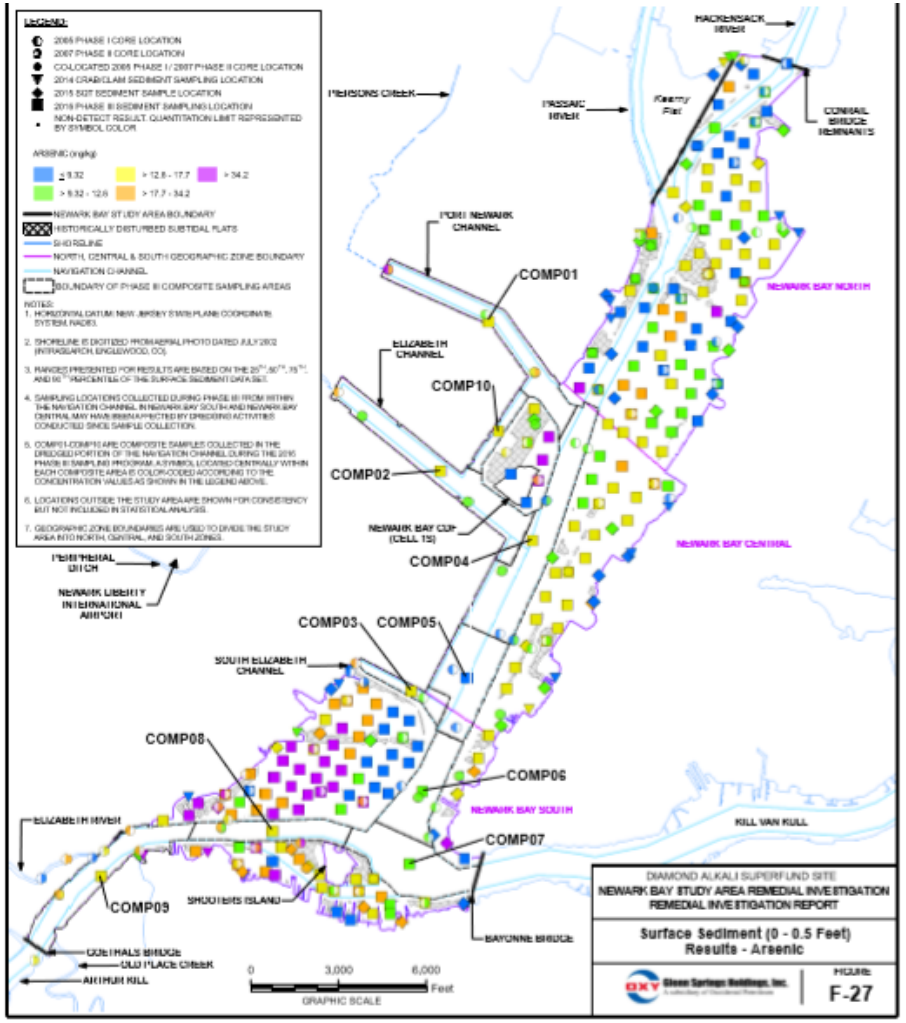
Spatial Distribution in Surficial Sediments - Mercury

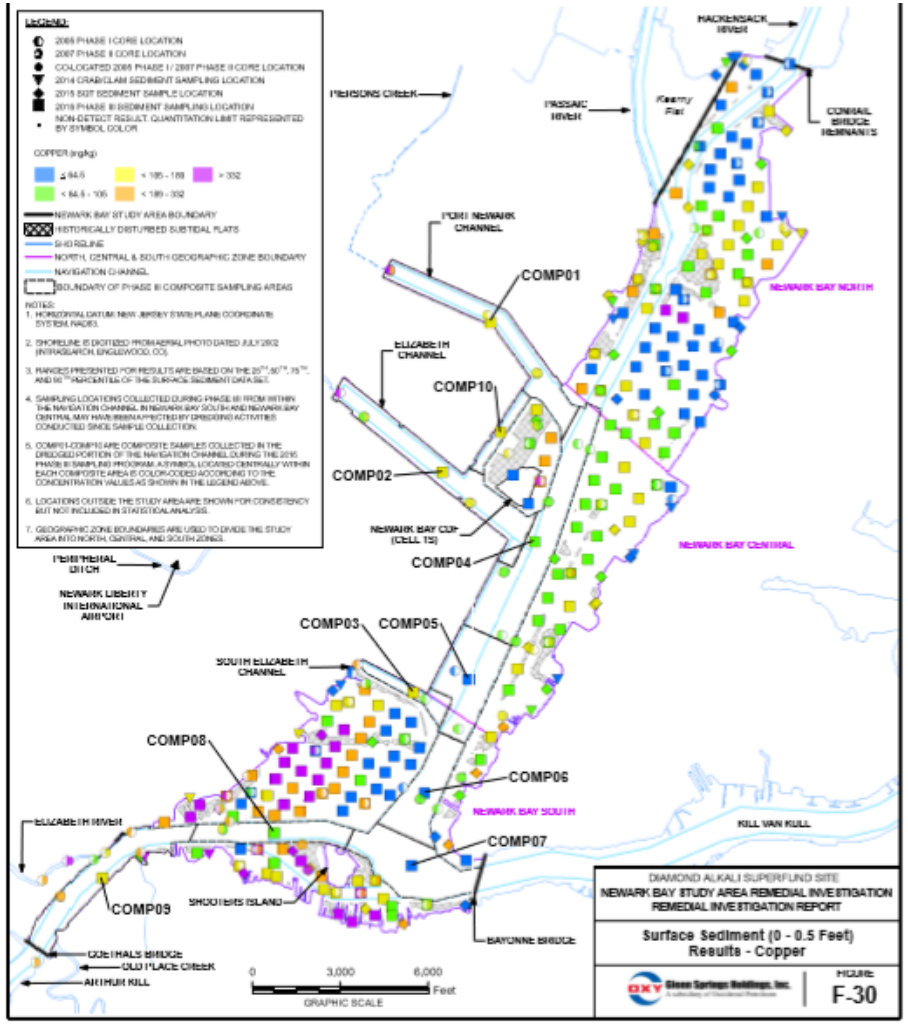
- Surficial Sediments
  - *2005 Phase I Core*
  - *2007 Phase II Core*
  - *2008 Phase I/II Colocated Core*
  - *2014 Crab/Clam Sediment*
  - *2015 SQT Sediment*
  - *2016 Phase III Sediment*
- Ranges based on 25th, 50th, 75th, and 90th percentiles of combined dataset



Reference: GSH, 2020, Draft RI Report

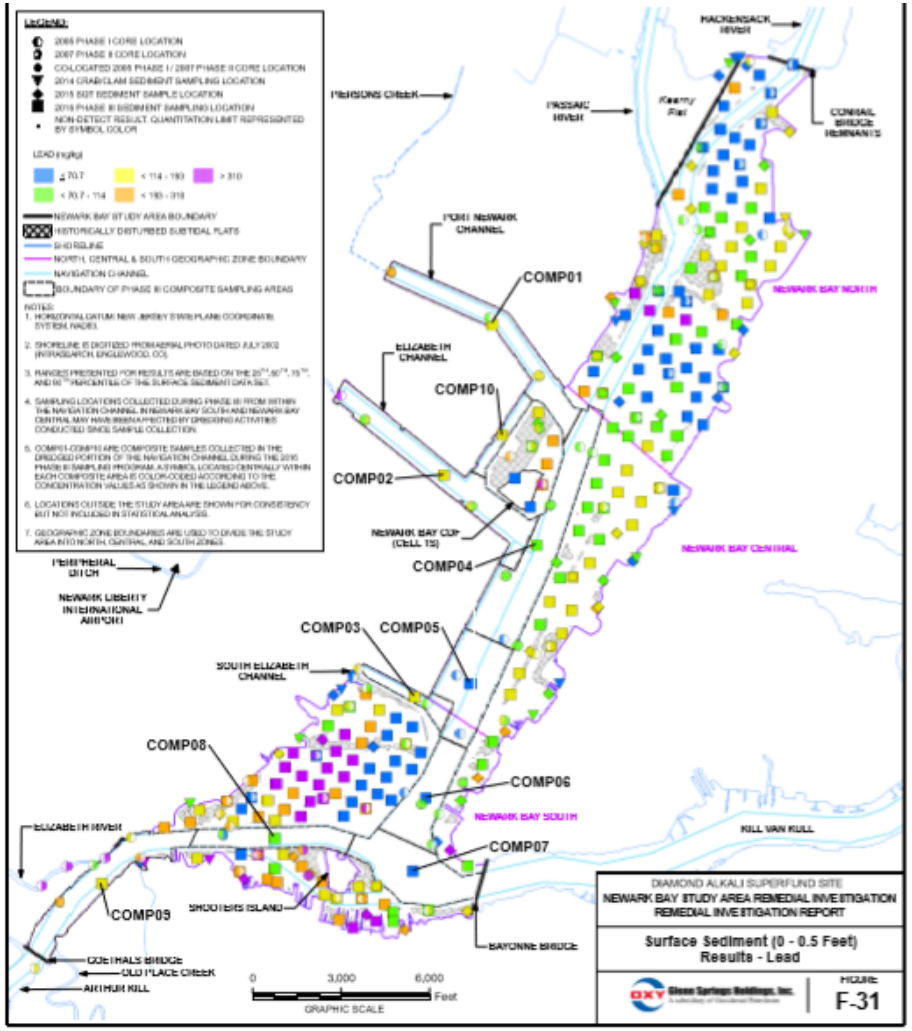
Spatial Distribution in Surficial Sediments – Arsenic and Copper

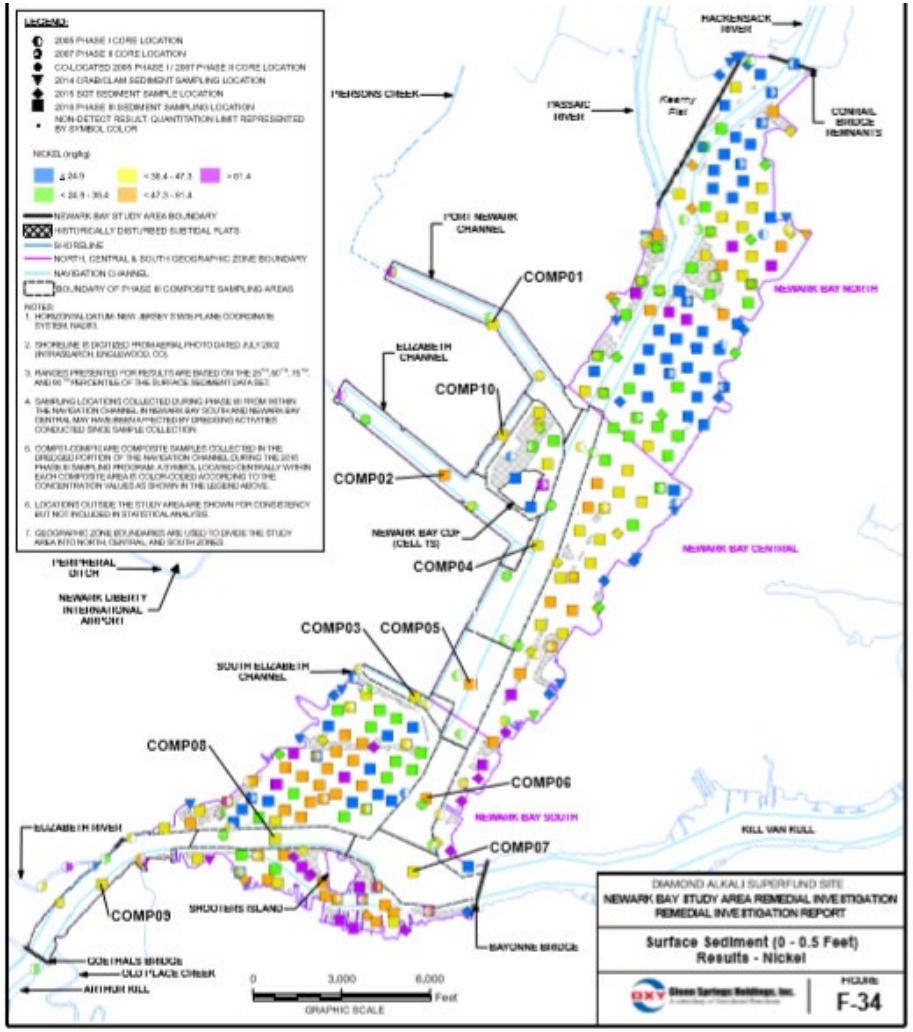




Reference: GSH, 2020, Draft RI Report

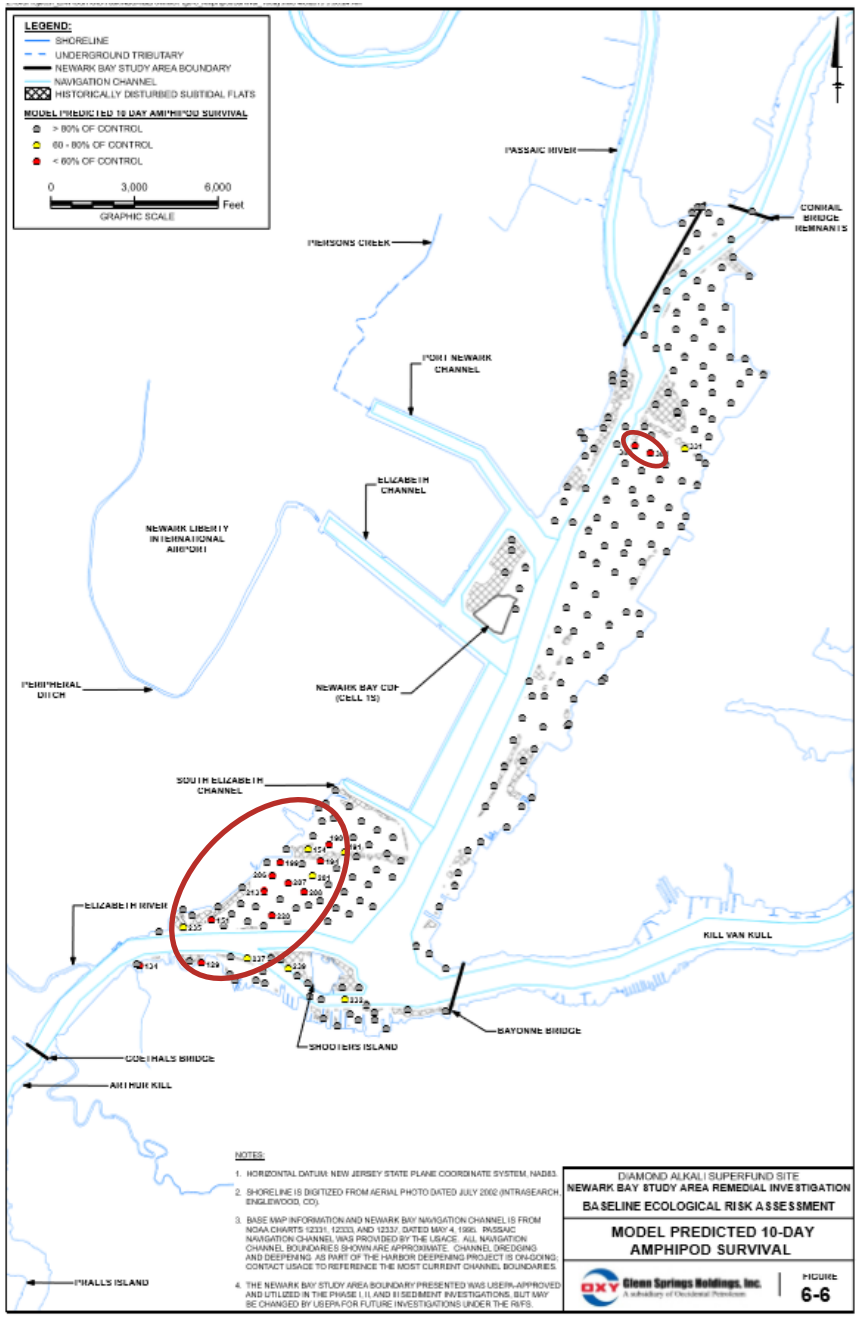
Spatial Distribution in Surficial Sediments – Lead and Nickel

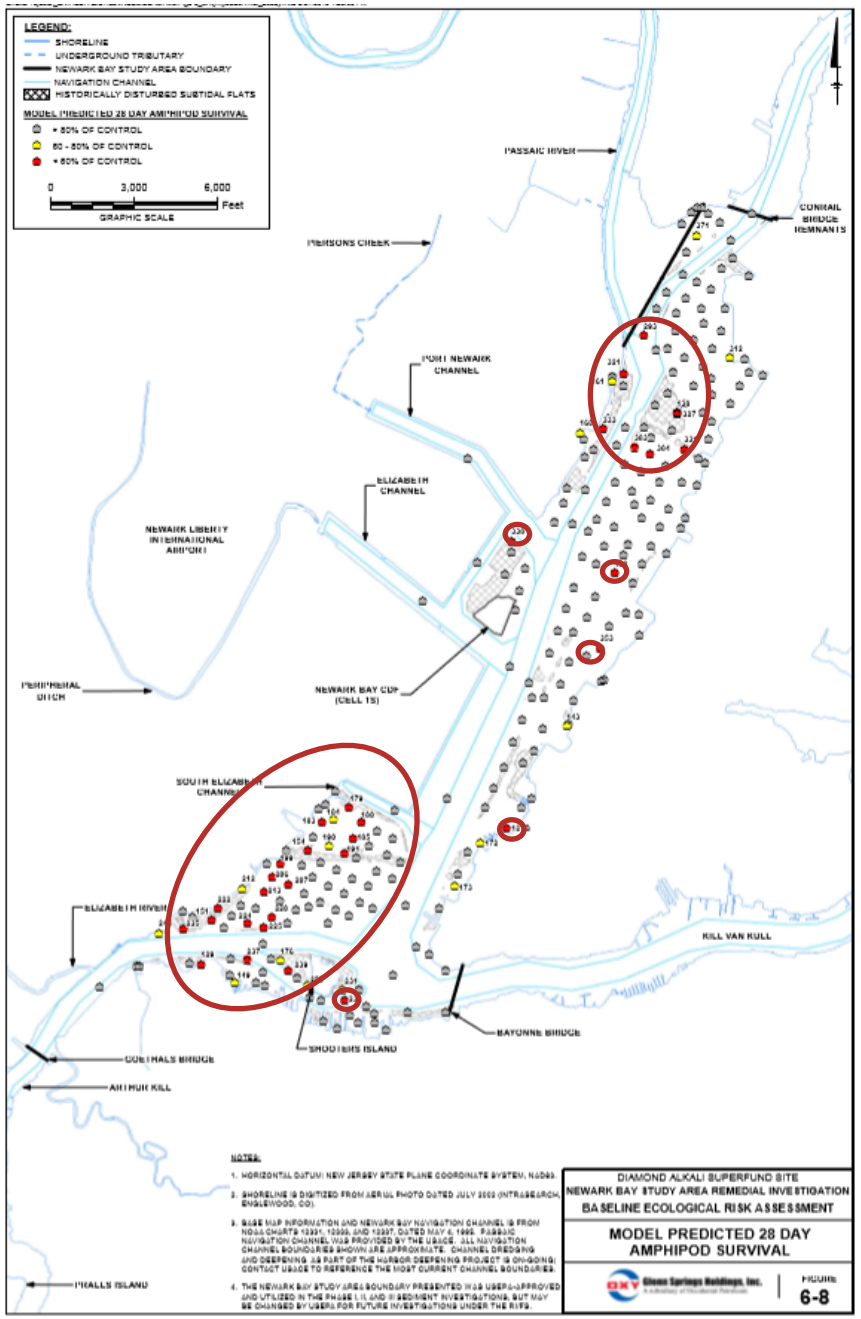




Reference: GSH, 2020, Draft RI Report

Model Predicted Toxicity 10-day and 28-day Survival





Comparison of Surficial Sediment Chemistry for Newark Bay and Nearby Waterbodies

Analyte	NOAA Eco-Benchmarks		95UCLs (mg/kg dw)							
			Newark Bay				LPR	Background		
	ER-L	ER-M	Baywide	North	Southeast	Southwest	Sitewide	Jamaica Bay_full	Jamaica Bay_SQT	Above Dundee Dam
Arsenic	8.2	70	22.9	15.79	27.1	29.8	9.6	6.8	3.6	6.4
Copper	34	270	191	109.9	156.3	282.3	170	53.1	14.4	150
Lead	46.7	218	193	137.2	170.4	303.2	270	61.6	24.1	440
Nickel	20.9	51.6	48.8	36.11	61.8	54.5	32	15.1	8.6	14

1. Maximum NBSA values for copper, lead, and nickel (but not arsenic) exceed ER-Ms
2. NBSA values are elevated compared to Jamaica Bay, where values are generally within the range of the benchmarks
3. NBSA 95UCLs for copper and lead appear consistent with Lower Passaic River and Above Dundee Dam values; whereas NBSA values for arsenic and nickel are higher
4. Within NBSA, copper and lead are highest in SW; arsenic and nickel appear lower in North relative to the other areas